

IN THE CLAIMS:

Claims 1-11 (Canceled)

12. (Currently Amended) A direct injection internal combustion engine system, comprising:  
at least one cylinder having a piston moving along an axis;  
a gas inlet and a gas outlet leading to an exhaust passage;  
an NO<sub>x</sub> reducing converter in said exhaust passage; and  
intake and exhaust valves associated with said cylinder and said gas inlet and gas outlet,  
arranged to provide internal exhaust-gas recirculation;

wherein said cylinder, said gas inlet and said gas outlet are arranged to provide layered  
lean operation of said engine; and

wherein said inlet passage is arranged to provide swirl in incoming gas having a swirl  
axis substantially transverse to said piston axis and ~~arranged to~~ **wherein in combination a  
subsequent charging movement of the piston** causes an intermixture of residual exhaust gas  
with said incoming gas.

13. (Previously Presented) An engine system as specified in claim 12 wherein said inlet  
passage is arranged to provide a swirl that is a tumble movement.

14. (Previously Presented) Internal combustion engine according to Claim 13 wherein a  
tumble plate is provided in said gas inlet.

15. (Previously Presented) Internal combustion engine according to claim 12 wherein said engine is an Otto engine.
16. (Previously Presented) Internal combustion engine according to claim 12 wherein said passage is arranged for a layered charging.
17. (Previously Presented) Internal combustion engine according to claim 12 wherein there is further provided an arrangement for external exhaust-gas recirculation.
18. (Previously Presented) Internal combustion engine according to Claim 17, wherein the external exhaust-gas recirculation arrangement includes an arrangement for cooling recirculated gases.
19. (Previously Presented) Internal combustion engine according to Claim 17, wherein the external exhaust-gas recirculation arrangement includes a control valve.
20. (Previously Presented) Internal combustion engine according to claim 12 wherein the swirl has an axis which lies in the region of 75° to 105° of said piston axis.
21. (Previously Presented) Internal combustion engine according to claim 12 wherein said reducing converter comprises a NO<sub>x</sub> storage catalyst.
22. (Previously Presented) Internal combustion engine according to claim 21 wherein said storage catalyst is controlled by a NO<sub>x</sub> sensor.

23. (Previously Presented) Internal combustion engine according to claim 12 wherein there is provided an arrangement for controlling internal exhaust-gas recirculation by adjustment of intake valve opening times in the direction of early.

24. (Currently Amended) A direct injection internal combustion engine system, comprising:

- at least one cylinder having a piston moving along an axis;
- a gas inlet and a gas outlet leading to an exhaust passage;
- a preliminary  $\text{No}_x$  catalyst in said exhaust passage followed downstream by an  $\text{No}_x$  storage catalyst;
- an external exhaust-gas recirculation line comprising an exhaust-gas cooler and a control valve wherein said exhaust-gas recirculation line couples said gas outlet with said gas inlet;
- a lambda probe arranged between said gas outlet and said preliminary  $\text{No}_x$  catalyst;
- a temperature sensor arranged between said preliminary  $\text{No}_x$  catalyst and said  $\text{No}_x$  storage catalyst;
- a  $\text{No}_x$  sensor arranged downstream said  $\text{No}_x$  storage catalyst; and
- intake and exhaust valves associated with said cylinder and said gas inlet and gas outlet, arranged to provide internal exhaust-gas recirculation;

wherein said cylinder, said gas inlet and said gas outlet are arranged to provide layered lean operation of said engine;

wherein said inlet passage is arranged to provide swirl in incoming gas having a swirl axis substantially transverse to said piston axis and **wherein in combination a subsequent charging movement of the piston** causes an intermixture of residual exhaust gas with said incoming gas; and wherein the system further comprises

a control unit receiving signals from said sensors and said probe for controlling said direct injection and said intermixture.

25. (NEW) direct injection internal combustion engine system, comprising:

at least one cylinder having a piston moving along an axis;

a gas inlet channel and a gas outlet leading to an exhaust passage;

an  $\text{No}_x$  reducing converter in said exhaust passage; and

intake and exhaust valves associated with said cylinder and said gas inlet channel and gas outlet, arranged to provide internal exhaust-gas recirculation;

wherein said cylinder, said gas inlet channel and said gas outlet are arranged to provide layered lean operation of said engine; and

wherein said inlet channel comprises a controllable tumble plate which can be laid against a wall of said inlet channel to allow incoming gas to pass by or can be set to provide swirl in incoming gas having a swirl axis substantially transverse to said piston axis and arranged to cause an intermixture of residual exhaust gas with said incoming gas.

26. (NEW) A direct injection internal combustion engine system, comprising:

at least one cylinder having a piston moving along an axis;

a gas inlet channel and a gas outlet leading to an exhaust passage;

a preliminary  $\text{No}_x$  catalyst in said exhaust passage followed downstream by an  $\text{No}_x$  storage catalyst;

an external exhaust-gas recirculation line comprising an exhaust-gas cooler and a control valve wherein said exhaust-gas recirculation line couples said gas outlet with said gas inlet channel;

a lambda probe arranged between said gas outlet and said preliminary No<sub>x</sub> catalyst;

a temperature sensor arranged between said preliminary No<sub>x</sub> catalyst and said No<sub>x</sub> storage catalyst;

a No<sub>x</sub> sensor arranged downstream said No<sub>x</sub> storage catalyst; and

intake and exhaust valves associated with said cylinder and said gas inlet channel and gas outlet, arranged to provide internal exhaust-gas recirculation;

wherein said cylinder, said gas inlet channel and said gas outlet are arranged to provide layered lean operation of said engine;

wherein said inlet channel comprises a controllable tumble plate which can be laid against a wall of said inlet channel to allow incoming gas to pass by or can be set to provide swirl in incoming gas having a swirl axis substantially transverse to said piston axis and arranged to cause an intermixture of residual exhaust gas with said incoming gas; and wherein the system further comprises

a control unit receiving signals from said sensors and said probe for controlling said direct injection and said intermixture.